Shiyan Jiang

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CURRENT EMPLOYMENT

Assistant Professor: Learning Design and Technology, College of Education, North Carolina State University, July 2019 – present.

EDUCATION

Ph.D. in Teaching and Learning (Specialization in Technology-enhanced STEM Education), University of Miami, 2013 – 2018. Advisor: **Dr. Ji Shen**

Online M.S. in Computer Science, Georgia Institute of Technology, 2017 – 2019.

B.S. in Educational Technology, East China Normal University, 2009 – 2013.

PRIOR EMPLOYMENT

Post-doctoral Associate: Language Technologies Institute, School of Computer Science, Carnegie Mellon University, July 2018 – July 2019. Advisor: **Dr. Carolyn P. Rosé**

Graduate researcher: Teaching and Learning, Teaching and Learning, University of Miami, August 2013-May 2018. Advisor: **Dr. Ji Shen**

Research Internship: Information Sciences and Technology, The Pennsylvania State University, Summer 2017. Advisor: **Dr. Mary Beth Rosson**

Data Visualization Developer Internship: Sun Sentinel, FL, Summer 2016

Research Internship: WISE, University of California, Berkeley, Summer 2015. Advisor: **Dr. Marcia Linn**

Research Internship: Concord Consortium, MA, Summer 2014. Advisor: **Dr. Charles Xie**

RESEARCH

Interest

Design-based research
Digital literacy as a means for STEM integration
Identity development
Data visualization

Emerging technologies for teaching and learning
Machine Learning
Natural Language Processing
Computer supported collaborative learning (CSCL)

Experience (Selected)

Project Forging a Path for Lifelong Learning and Career Readiness through Collaborative Learning (**Microsoft** and **NSF** Award # 1443068, 1822831 and 1546393; PIs: Dr. Carolyn P. Rosé and colleagues); April 2019 – present

- Designing a Chabot for effective collaborative programming.
- Researching role-taking behaviors in online collaborative programming and the role of AI agent for equal learning opportunities in small groups.

Project Innovative Personalized Writing Feedback System for Youth (**Schmidt Foundation**; PIs: Drs. Kenneth Koedinger and Carolyn P. Rosé); July 2018 – present

- Developing an intelligent writing feedback system for TurnItIn (www.turnitin.com), a commercial writing service company launched in 1997.
- Researching computational linguistics, with a focus on rhetorical structure of writing.

Project STEM+L: Integrating STEM and Digital Literacies with Adolescents (**NSF** Award # 1713191; PIs: Drs. Ji Shen and Blaine E. Smith); September 2014 – June 2018

- Developed and implemented a design-based research program in which youth create digital multimodal artifacts in small groups across informal and formal learning settings.
- Researched disciplinary identity, with a focus on participation trajectories in integrated STEM and Literacy practices.
- Designed several key functions (e.g., knowledge visualization and logging data) for iKOS (ikos.miami.edu), a CSCL platform funded by various agencies (e.g., NSF) for 7 years.
- Led professional development workshops for teachers in different countries.

Project TREES: Transformative Robotics Experience for Elementary Students (**NSF** Award # 1523010; PIs: Drs. Ji Shen, Lauren Barth-Cohen, and Moataz Eltoukhy); May 2015 - May 2018

- Developed and implemented a robotics curriculum for fifth-graders to learn programming in formal classroom settings.
- Researched learning analytics, with a focus on process mining of computational thinking.
- Designed assessment items to measure computational thinking.

Project We Are! Building Identity, Participation and Connectivity (Funded by **Center for Online Innovation in Learning**; PI: Dr. Mary Beth Rosson); May 2017 – December 2017

- Led research in designing a learning analytics dashboard for college students in interdisciplinary teams (e.g., data science and learning sciences).
- Developed and conducted semi-structured interviews with online learners.
- Provided design insights for a visualization tool to support self-regulated learning.

Project GRIDS: Graphing Research on Inquiry with Data in Science (**NSF** Award # 1418423; PIs: Drs. Marcia Linn and Ou Liu); May 2015 - August 2015

- Implemented a 10-day self-propelled vehicles unit at San Jose Middle school, CA.

- Collected and analyzed students' responses using KI (Knowledge Integration) rubric.

Project Large-Scale Research on Engineering Design Based on Big Learner Data Logged by a CAD Tool (**NSF** Award # 1348530; PI: Dr. Charles Xie); May 2014 - August 2014

- Implemented a one-week engineering design activity at Arlington High School, MA.
- Researched learning analytics, with a focus on process mining of engineering design.

Peer - reviewed journal article

Jiang, S., Shen, J., & Smith, B. E. (2019). Designing discipline-specific roles for interdisciplinary learning: two comparative cases in an afterschool STEM+ L programme. *International Journal of Science Education,* 1-24.

Jiang, S., Smith, B. E., & Shen, J. (2019). Examining how different modes mediate adolescents' interactions during their collaborative multimodal composing processes. *Interactive Learning Environments*, 1-14.

Smith, B. E., Shen, J., & **Jiang, S.** (2019; invited article). The science of storytelling: Middle schoolers engaging with socioscientific issues through multimodal science fictions. *Voices from the middle, 26*(4).

Barth-Cohen, L., **Jiang, S.**, Shen, J., Chen, G., & Eltoukhy M. (2018). Interpreting and navigating multiple representations as central to computational thinking in a robotics programming environment. *Journal for STEM Education Research.*

Sung, S., Shen, J., **Jiang, S.**, & Chen, G. (2017). Comparing the effects of dynamic computer visualization on undergraduate students' understanding of osmosis with randomized posttest-only control group design. *Research and Practice in Technology Enhanced Learning*.

Chen, G., Shen, J., Barth-Cohen, L., **Jiang, S**., Huang, X., Eltoukhy, M. (2017). Assessing elementary students' computational thinking in everyday reasoning and robotics programming. *Computer & Education, 109*, 162-175.

Proceeding

Jiang, S., Yang, K., Suvarna, C., Casula, P., Zhang, M., & Rosé, C. (2019). Applying Rhetorical Structure Theory to Student Essays for Providing Automated Writing Feedback. In *Proceedings of the Workshop on Discourse Relation Parsing and Treebanking 2019* (*pp*. 163-168).

Jiang, S. & Kahn, J. (2019; nominee of best paper). Data wrangling practices and processes in modeling family migration narratives with big data visualization technologies. *Proceedings of the 13th International Conference of the Computer Supported Collaborative Learning (CSCL),* Lyon, France.

Jiang, S., Shen, J., Smith, B., & Kibler, K. (2018). Examining science identity development in disciplinary role-taking multimodal composing environment. *Proceedings of the 13th International Conference of the Learning Sciences (ICLS),* London, UK.

Smith, B., Shen, J., **Jiang, S.**, Chen, G., Hamaoui, M., & Torralba, J. (2018). Multimodal reflection: Adolescents remixing and sharing their experiences in an informal STEM+L academy. *Proceedings of the 13th International Conference of the Learning Sciences (ICLS),* London, UK.

Jiang, S., Shen, J., & Smith, B. (2016). Integrating science and writing in multimedia science fictions: Investigating student interactions in role-taking. *Proceedings of the 12th International Conference of the Learning Sciences (ICLS)*, Singapore.

Shen, J., Chen, G., Barth-Cohen, L., Eltoukhy, M., & **Jiang, S.** (2016). Developing a language-neutral instrument to assess fifth graders' computational thinking. *Proceedings of the 12th International Conference of the Learning Sciences (ICLS)*, Singapore.

Jiang, S., Shen, J., Sun, Y. (2015). Conceptualizing, analyzing, and visualizing massive data on student engagement in MOOCs: A literature review. *Proceedings of the 11th International Conference of the Computer Supported Collaborative Learning (CSCL)*, Gothenburg, Sweden.

Book chapter

Shen, J., **Jiang, S.**, & Liu, O. L. (2015). Reconceptualizing a college science learning experience in the new digital era: A review of literature. In X. Ge, D. Ifenthaler, J.M. Spector (Eds.) *Full steam ahead: Emerging technologies for STEAM (pp. 61-79)*. New York: Springer.

Presentation

Jiang, S., Shen, J., & Smith, B.E. (2019, April). *Patterns and trajectories of an adolescent's participation during an integrated STEM and Digital Literacies program*. Paper to be presented at the annual conference of American Educational Research Association (AERA), Toronto, Canada.

Kahn, J. & **Jiang, S**. (2019, April). *Youth data wrangling and modeling family migration*. Paper to be presented at the annual conference of American Educational Research Association (AERA), Toronto, Canada.

Smith, B. E., Kolovou, M., **Jiang, S.**, Ran, H., Torralba, J., & Shen, J. (2019, April). *Multidimensional meaning-making: Adolescents leveraging visuals and sounds in their multimodal science fictions.* Paper to be presented at the annual conference of American Educational Research Association (AERA), Toronto, Canada.

Chen, G., Shen, J., **Jiang, S.**, Barth-Cohen, L., & Eltoukhy, M. (2018, April). *Linking elementary students' problem-solving process to computational thinking*. Paper presented at the 2018 annual conference of American Educational Research Association (AERA), New York City, NY.

Jiang, S. & Cong, Q. (2017, September). *Exploring the impact of students' academic usage of mobile devices on technostress and academic performance: A double-edged sword*. Paper presented at the annual conference of Association for Learning Technology (ALT), Liverpool, UK.

Jiang, S., Smith, B.E., & Shen, J. (2017, April). *Peer Interaction in multimodal composition: The story behind the scenes*. Paper presented at the annual conference of American Educational Research Association (AERA), San Antonio, TX.

Barth-Cohen, L., **Jiang, S.,** Shen, J., Chen, G., & Eltoukhy, M., (2017, April). *Elementary school students' computational thinking practices in a robotics-programming environment*. Poster presented at the annual conference of American Educational Research Association (AERA), San Antonio, TX.

Shen, J., Smith, B., **Jiang, S.**, Kibler, K., Chen, G., & Irina, M. (2017, October). *Examining middle school students' collaborative multimodal composing through disciplinary identity development*. Poster presented at the Annual International Convention of the Association for Educational Communications and Technology (AECT), Jacksonville, FL.

Jiang, S., Smith, B.E., & Shen, J. (2016, October). *Exploring multimodal composition in collaborative digital learning environments*. Paper presented at the Annual International Convention of the Association for Educational Communications and Technology (AECT), Las Vegas, NV.

Jiang, S., Shen, J., & Smith, B. (2016, April). *Assessing students' scientific literacy in collaborative science fiction writing.* Poster presented at the 2016 Annual Meeting of the American Educational Research Association (AERA), Washington, D.C.

Sung, S., Shen, J., **Jiang, S.,** & Chen, G. (2016, April). *The effect of including dynamic computer visualizations on assessing college students' interdisciplinary understanding of osmosis*. Poster to be presented at the 2016 Annual Meeting of the American Educational Research Association (AERA), Washington, D.C.

Xie, C., Nourian, S., **Jiang, S.** (2015, April). *Performance assessment of engineering design using process analytics based on CAD software*. The National Association for Research in Science Teaching (NARST) Conference 2015, Chicago, IL.

Avalos, M. A., Bengochea, A., Malova, I., **Jiang, S.**, Carlo, M., & Augustin, J. (2014, December). *Vocabulary instruction for English learners then and now: Do we have it right for the future?* Paper presented at the 64th Annual Conference of the Literacy Research Association (LRA), Marco Island, FL.

Shen, J., **Jiang, S.**, Cheng, G., & Namdar, B. (2014, October). *Designing the innovative Knowledge Organization System (iKOS) for science learning*. Poster presented at the Annual International Convention of the Association for Educational Communications and Technology (AECT), Jacksonville, FL.

Other

Jiang, S. (2016). A technology-enhanced curriculum: Integrating STEM learning with data visualization, published online (www.wise.berkeley.edu).

Assisted with the following NSF grant proposal writing

Peppler, K., Rosé, C., McCann, J., & Geoff, K. (2019). ReCrafting Computer Science: Concretizing Participatory Machine Learning Through Tangible Fiber Crafts. ($ ~ 2.5M). Declined

Shen, J. & Smith, B. (2017). Integrating STEM and Digital Literacies with Adolescents (Project STEM+L). National Science Foundation. ($ ~350K). Funded

Shen, J., Barth-Cohen, L., & Eltoukhy, M. (2015). Transformative Robotics Experience for Elementary Students (Project TREES). National Science Foundation. ($ ~300K). Funded

Shen, J., Smith, B., Padolf, A., & Jordan, S. (2015). Digesting STEM through Food Myth-busting. ($ ~1,800K). Declined

Shen, J., Xie, C., & Ahn, S. (2014). Assessing Modeling Practices Through Comprehensive Modeler Profiling. ($ ~1,400K). Declined

Shen, J., Barth-Cohen, L., Secada, W. G., & Visser, U. (2014). EXP: Developing Ontologies for Collaboration in a Knowledge-centered Community (DOCKC). ($ ~550K). Declined

Reviewer

Journal Review: Computers & Education

Grant Review: National Science Foundation (ITEST)

Conference Review: AERA, 2018/2017/2016/2015; ICLS, 2018

TEACHING

Graduate Level

Instructor of ECI 519 (602): Data Visualization in Education, North Carolina State University, Fall 2019. Taught courses about the application of data visualization in educational contexts.

Invited speaker of SCS 11344: Machine Learning in Practice, Carnegie Mellon University, Fall 2018 and Spring 2019. Taught courses in Machine Learning for graduate students.

Invited speaker of JMM 629: **Interactive Data Visualization**, University of Miami (UM), Fall 2016. Taught courses in data visualization for graduate students.

Invited speaker of TAL 690: **Introduction to Learning Sciences**, UM, Spring 2016. Taught courses in Learning sciences for doctoral students.

Undergraduate level

Instructor of TAL 543: Science Instruction in the Secondary School, UM, Spring 2016. Taught courses about STEM-related classroom technologies for pre-service teachers.

Teaching Assistant of TAL 323: Science Instruction in the Elementary School, UM, Fall 2013/Fall 2014. Led class discussions and graded student assignments.

Teacher professional development

Instructor of educational technology workshops for in-service teachers, Summer 2018 (n = 12); Fall 2017 (n = 73); Spring 2016 (n = 30); Fall 2014 (n = 25). Trained and supervised in-service teachers to implement technology-enhanced STEM projects.

K-12 teaching

Instructor of multiple formal and informal programs associated with Project STEM+L, including

- Afterschool program for 5th-8th graders from Miami-Dade public schools (Summer 2018; Spring 2018; Fall 2017; Summer 2017; Fall 2015).
- Elective STEAM course for Henry S. West Laboratory School (Fall 2017; Fall 2016)

- Afterschool program for Ponce de Leon Middle School (Spring 2015)

Instructor of project First Star UM Academy, UM, Summer 2017. Taught digital composing to guide under-represented high schoolers to envision future professions.

AWARDS

Early Career Workshop, CSCL, 2019

Bronze Award in International Serious Play (Treasure Key, an educational game), 2017

Innovation Award in Learning Technology Design and Development, the 2nd e-ICON World Contest, South Korea, 2012